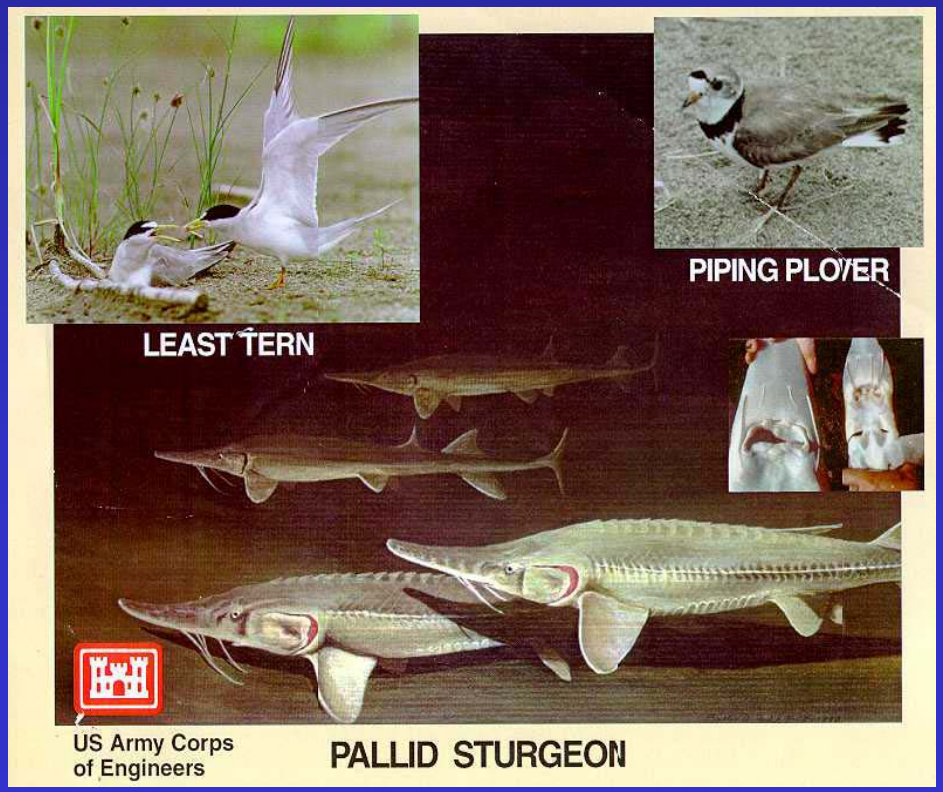
U.S. Army Corps of Engineers
Northwestern Division

Missouri River Basin Water Management



Spring Rise
First Plenary Session
St. Joseph, MO

June 1, 2005

Presentation Topics
Spring Rise Summary

- Summary of current annual Gavins Point Dam release pattern
- Summary of potential new release pattern with the focus on the Spring Rise time period
- Sideboards for the Spring Rise Development
  - Time periods open for input
  - Identification of potential spring rise criteria that need detailed definition with 2003 Amended BiOp specifications identified

New Water Control Plan (2004)
Current Annual Release Pattern
Normal Runoff Period

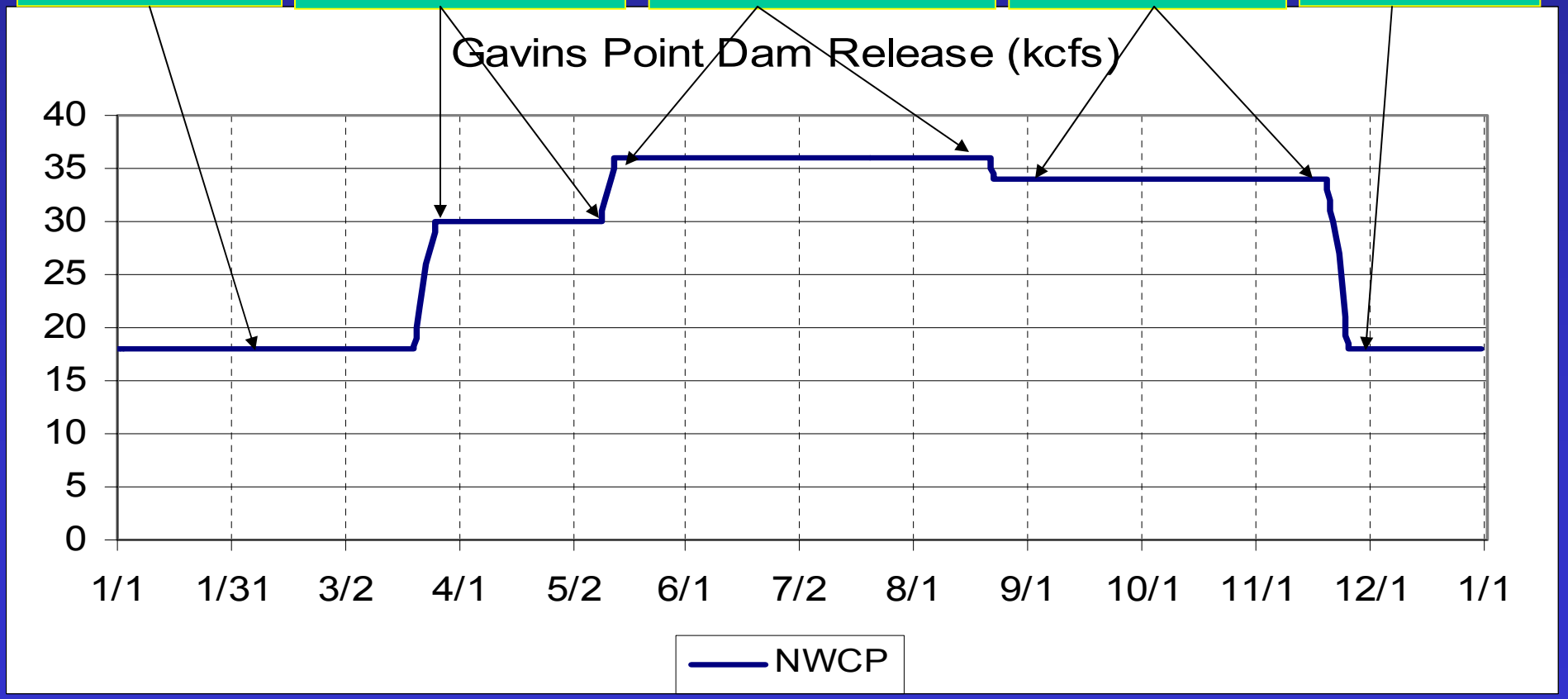
Winter releases typically 12 to 20 kcfs

Increased releases to support navigation until birds start nesting

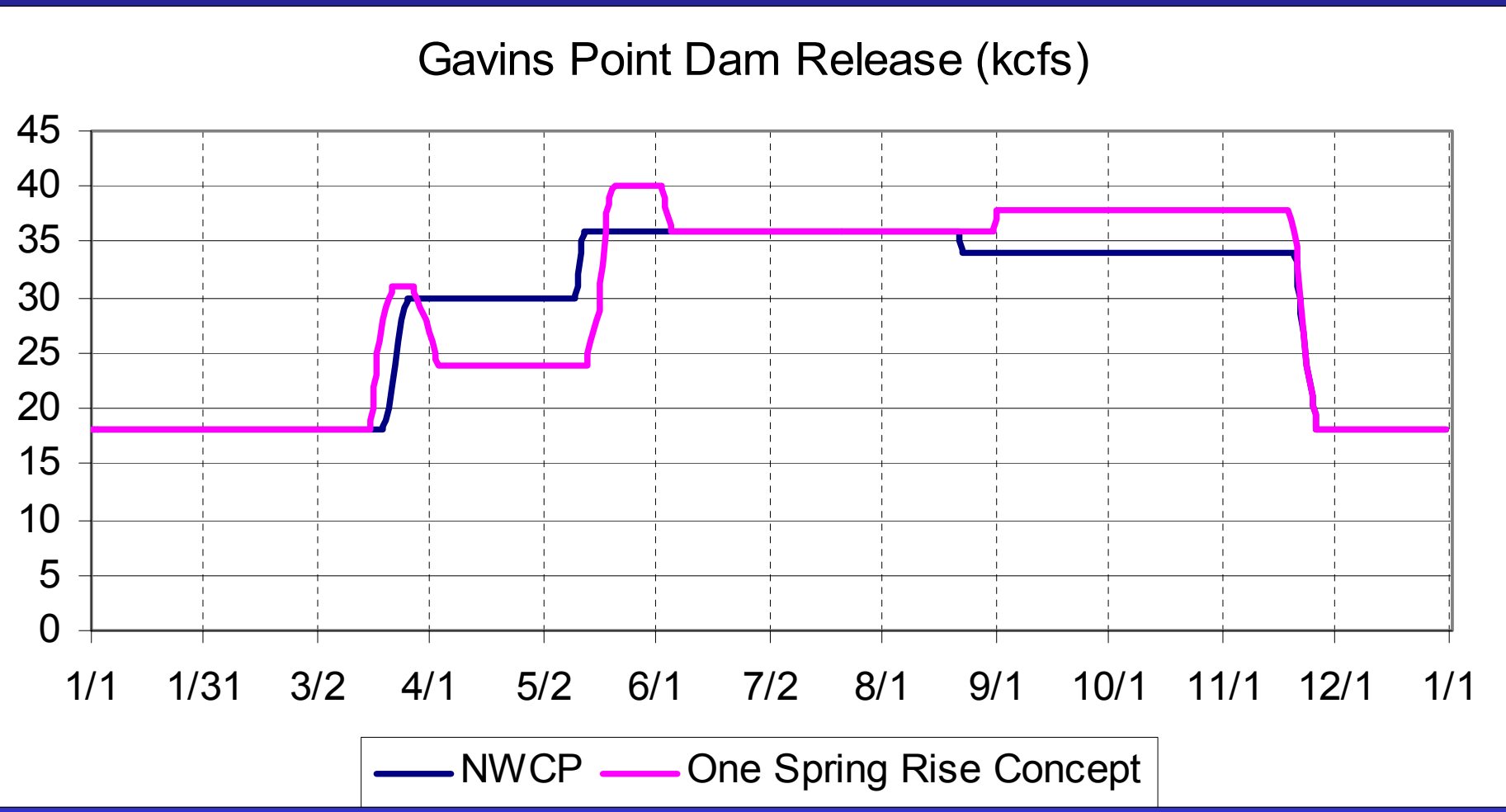
Increased releases to meet navigation needs throughout the summer

Releases to meet fall navigation needs to end of season

Reduction to winter requirements.



Overlaying of One Spring Rise Concept over the New Water Control Annual Release Pattern

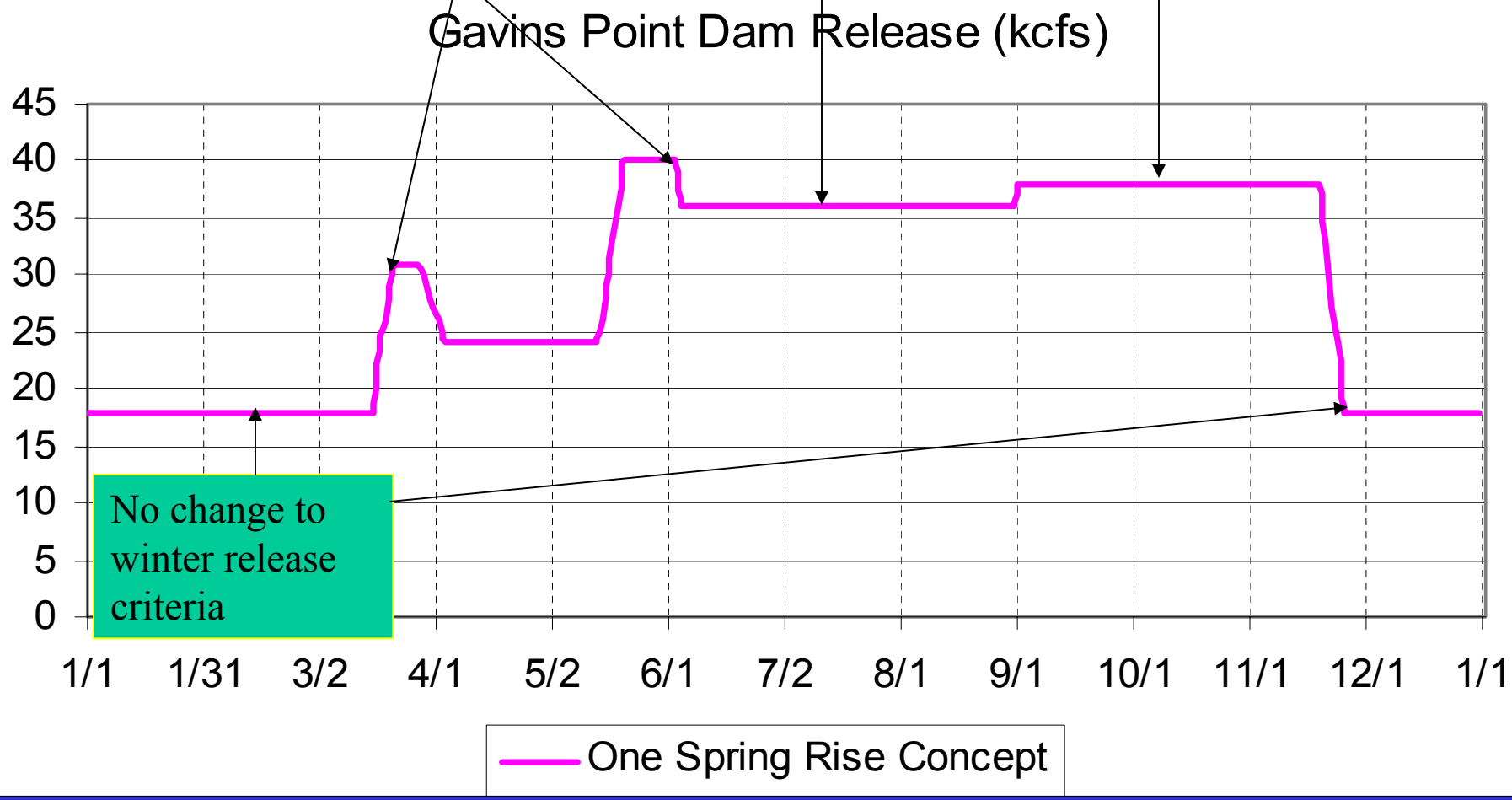


One Spring Rise Concept
Annual Release Pattern
Normal Runoff Period

Change to bimodal spring rise criteria

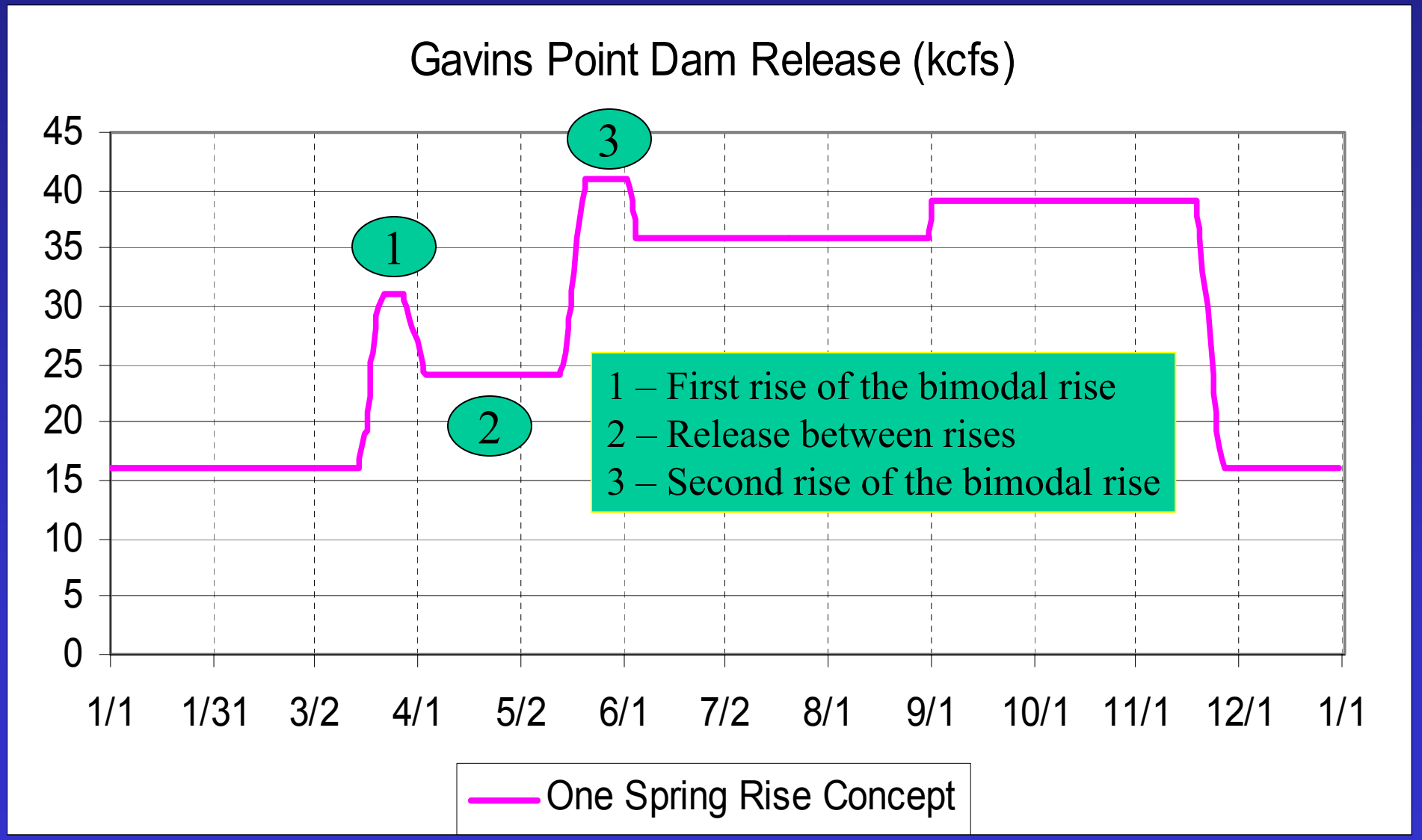
No change to summer release criteria

No change to fall release criteria

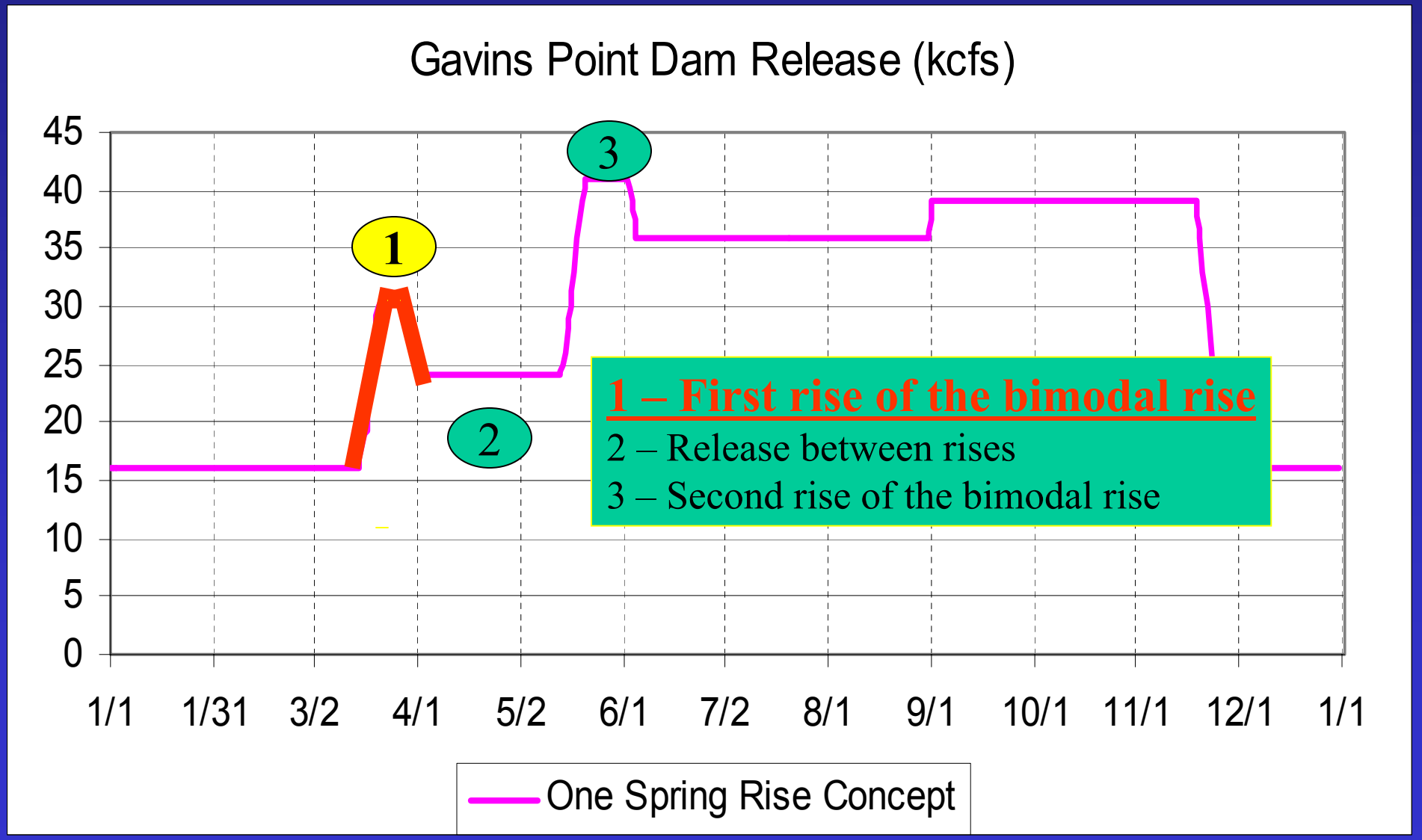


No change to winter release criteria

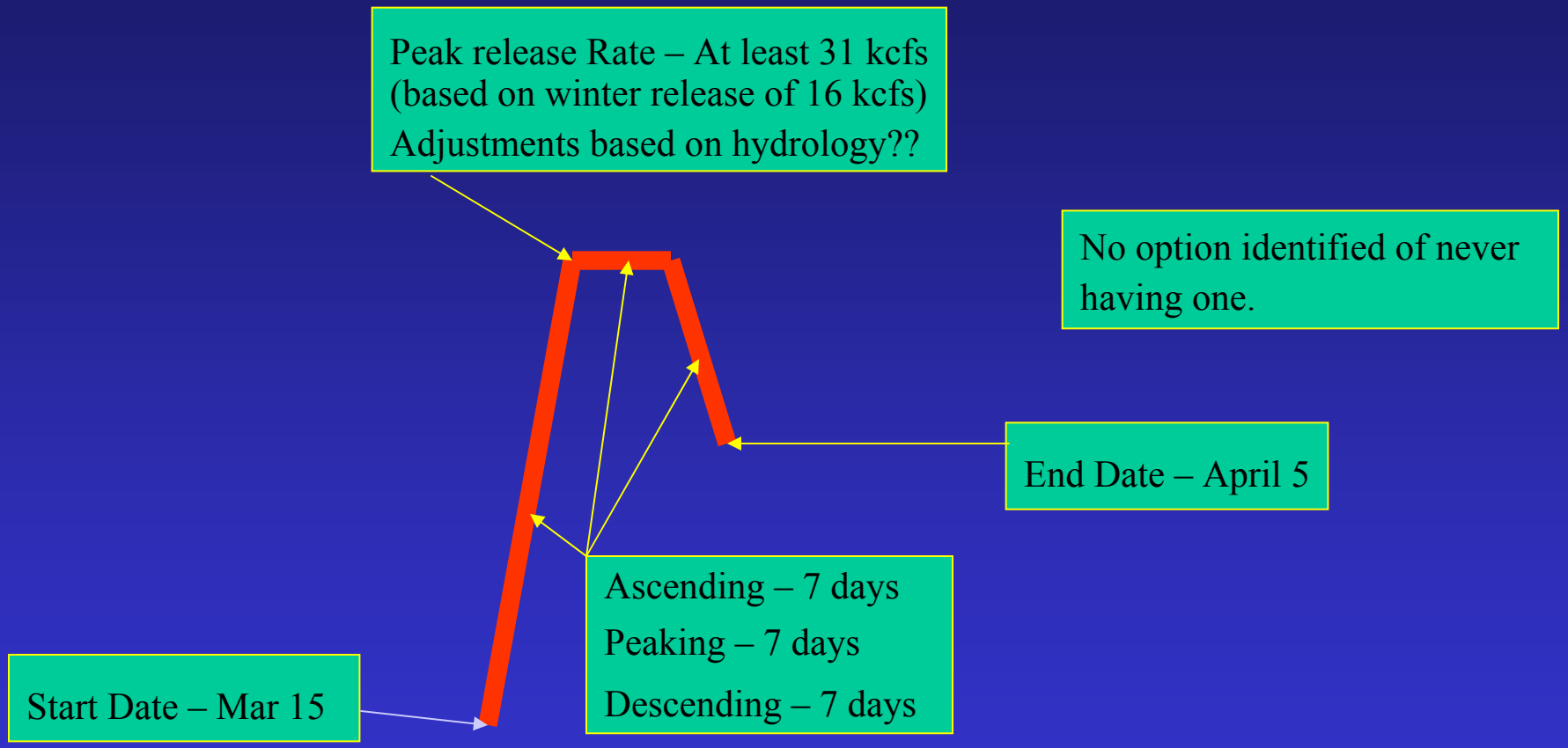
Three Components of the Bimodal Spring Rise for One Spring Rise Concept



Three Components of the Bimodal Spring Rise for One Spring Rise Concept



1 – First Rise of the Bimodal Rise

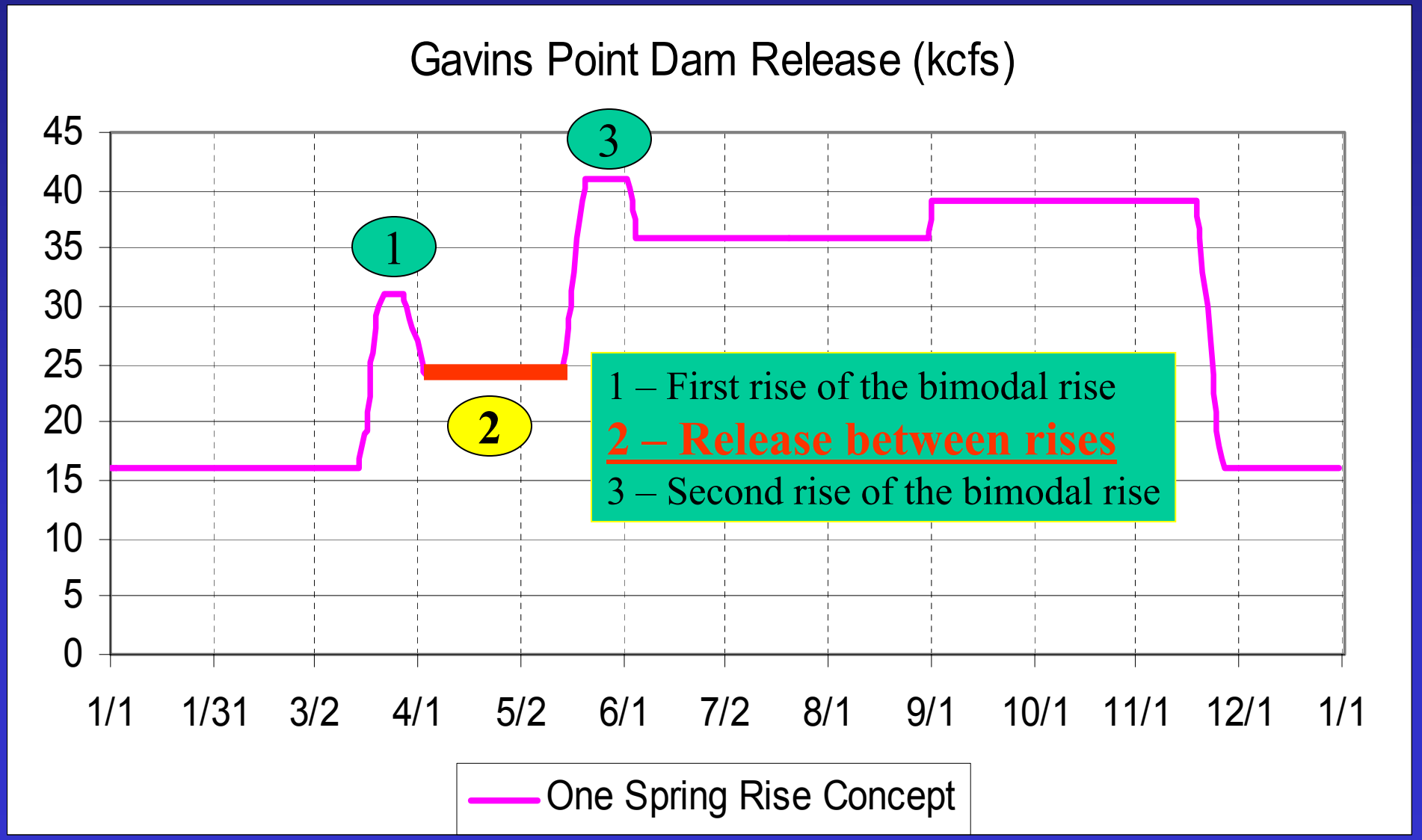


1 – First Rise of the Bimodal Rise

- 2003 Amended BiOp
  - Period – March 15, with 7/7/7 up/hold/down
  - Release Rate – at least 31 kcfs
- Options

  Variable rate depending on winter release (+ at least 15 kcfs)
  - Alternate timing of this rise
  - No rise during this period

Three Components of the Bimodal Spring Rise for One Spring Rise Concept



2 – Release Between Rises

Release Rate – “minimum amount possible while still maintaining project purposes”

Adjustments for Hydrology – Yes

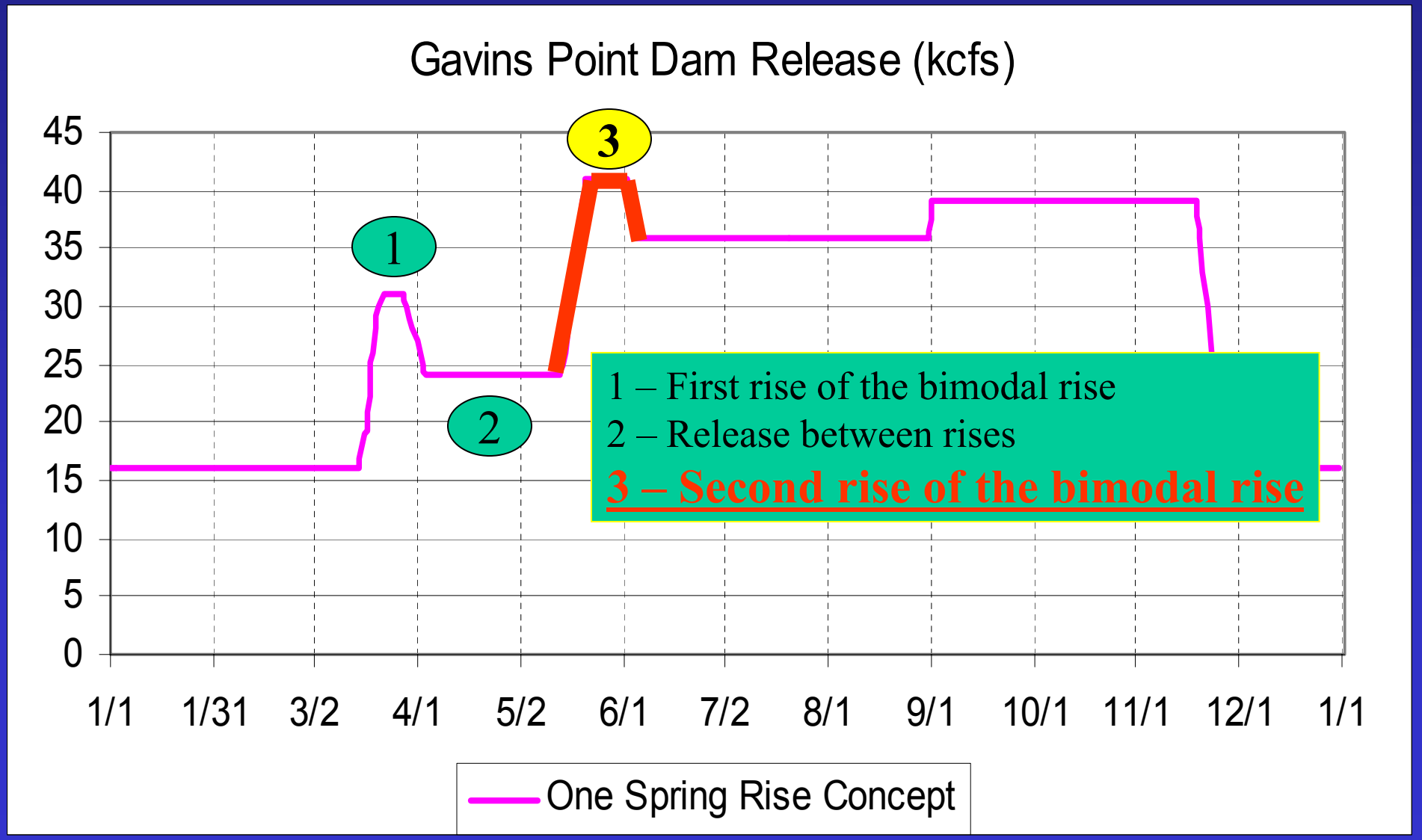
Start Date – following first rise, which would compute to be March 15 plus 21 days, or **April 5**

End Date – start of second rise, which could be as early as **May 1** or as late as **May 15**

2 – Release Between Rises

- 2003 Amended BiOp
  - Period – Following first rise to no earlier than May 1 and no later than May 15
  - Release Rate – “Minimum amount possible while still maintaining project purposes”
- Options
  - Minimum service in all years except non-navigation years or in years flood storage evacuation is required
  - Full to minimum service based on March 15 guide curve plus any flood storage evacuation requirements
  - Variable between full and minimum service based on a new guide curve

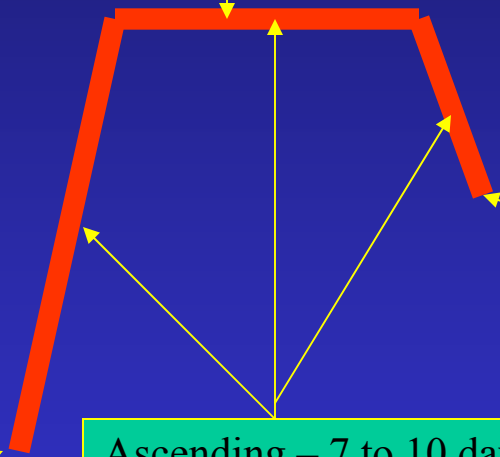
Three Components of the Bimodal Spring Rise for One Spring Rise Concept



3 – Second Rise of the Bimodal Rise

Release Rate – 16 kcfs added to the existing flow

Adjustments for Hydrology – Yes



Start Date –as early as **May 1**

or as late as **May 15**

Ascending – 7 to 10 days

Peaking – Minimum of 14 days

Descending – no less than 7 days

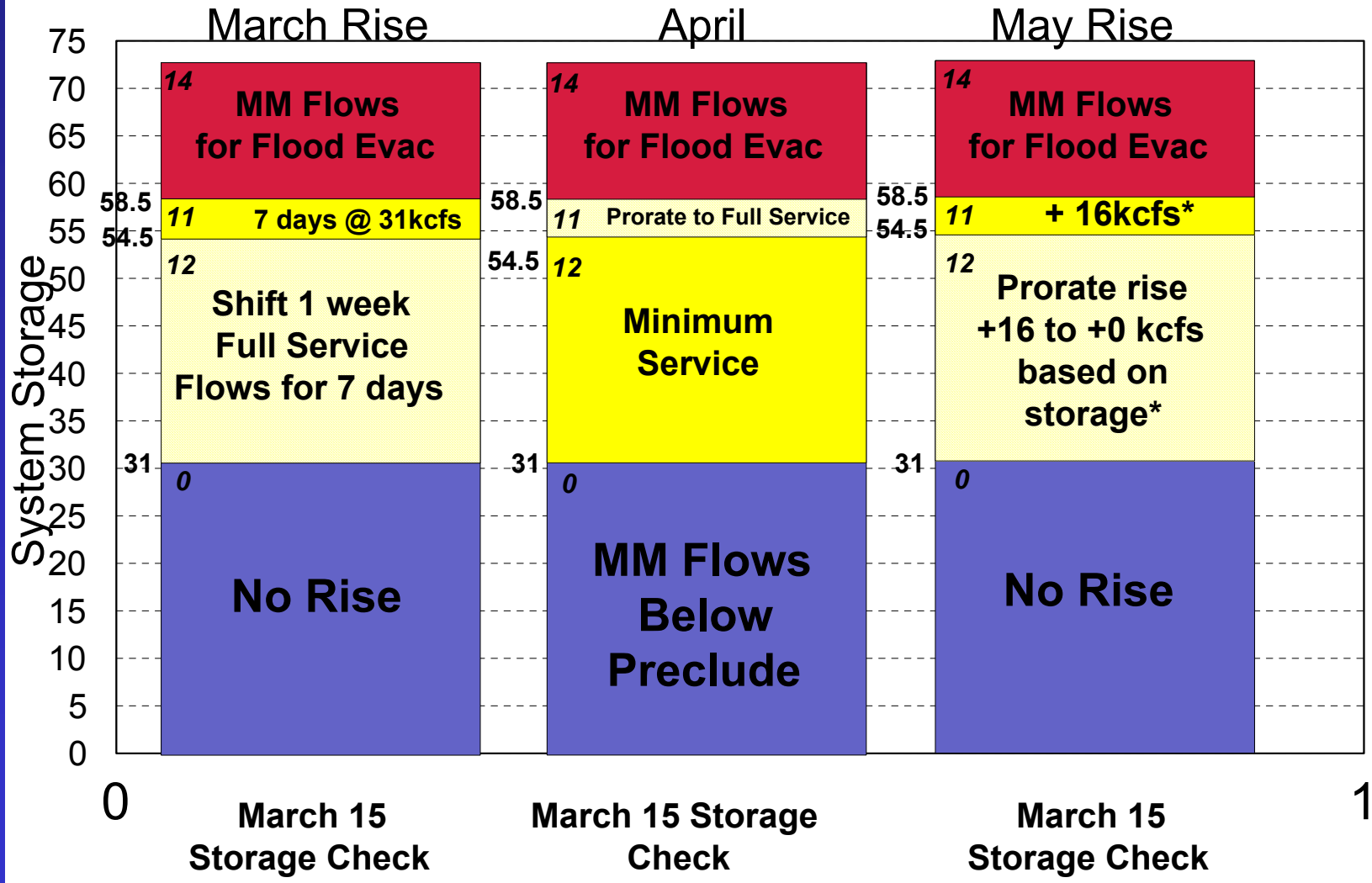
End Date – As early as **May 28** and as late as **July 1**

3 – Second Rise of the Bimodal Rise

- 2003 Amended BiOp
  - Period – Ramp up beginning no earlier than May 1 and no later than May 15 to ramp down beginning no earlier than June 15 but no later than July 1 with 7- to 10-day ramp up and 7-day ramp down (2-wk min)
  - Release Rate – 16 kcfs above the previous flow
- Options
  - Timing, Magnitude, and Duration
  - Stop protocols:
    - Downstream flood control constraints – variable increases from current
    - Suspended or variable rise during a drought

Summary of Spring Rise Criteria Questions

- 1 – First rise – Flat release like 31 kcfs, increase over previous release level, others??
- 2 – Release between rises (based on service level) – Full, minimum, variable between full with evacuation to minimum, or lower service?? (likely affects release magnitude during second rise)
- 3 – Second rise magnitude – Stay at 16 kcfs over previous service level??
- 3 – Second rise duration – 2 weeks at maximum Q or greater or lesser duration?? start and end dates??
- 3 – Stop protocols (magnitude and frequency)
  - Flood control constraints – Full rise increase to some lower level increase)
  - Drought preclude – Full rise until a set storage level and variable frequency and/or magnitude based on a “guide curve”



* After determining the magnitude of the May Rise based on the March 15 storage check, factor the resultant by 75% to 125% based on the March 1 runoff forecast.

Missouri River Region

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